

Model Creation

Step 1 : Import Libraries

```
In [16]: import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestRegressor
from sklearn.metrics import mean_absolute_error, mean_squared_error, r2_score
```

Step 2 : Load the dataset and display the first 5 rows

```
In [33]: data = pd.read_csv("C:\\AIML\\project\\shivamogga-house-price\\shivamogga_house_cleaned\\shivamogga_house_cleaned.csv")
data.head()
```

```
Out[33]:
```

	Total_SqFt	BHK	Bathrooms	Dist_to_School_km	Dist_to_Hospital_km	Dist_to_Railway_kn
0	1.367597	4	4	-0.281449	-0.406812	-1.18276
1	1.255005	4	4	2.584619	1.337755	-1.09393
2	1.259438	4	4	1.124977	0.869351	0.40672
3	0.922548	4	4	1.140182	1.916091	0.34009
4	-1.168829	2	3	-0.760395	0.630369	1.64088

```
In [36]: data.drop("Price_per_SqFt",axis=1,inplace=True)
```

```
In [37]: data.head()
```

```
Out[37]:
```

	Total_SqFt	BHK	Bathrooms	Dist_to_School_km	Dist_to_Hospital_km	Dist_to_Railway_kn
0	1.367597	4	4	-0.281449	-0.406812	-1.18276
1	1.255005	4	4	2.584619	1.337755	-1.09393
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4	-1.168829	2	3	-0.760395	0.630369	1.64088

In [38]: `data.info()` *#check the info*

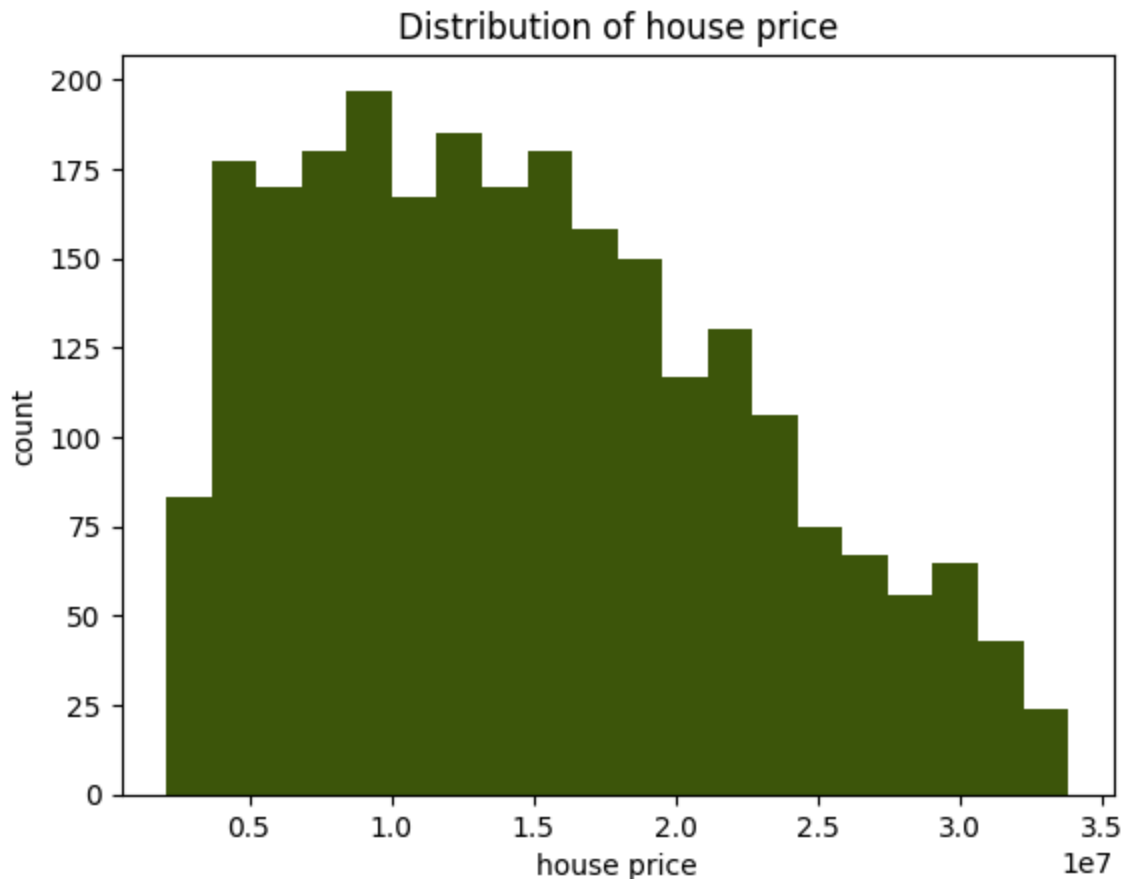
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2500 entries, 0 to 2499
Data columns (total 19 columns):
#   Column                                Non-Null Count  Dtype
---  -
0   Total_SqFt                            2500 non-null   float64
1   BHK                                    2500 non-null   int64
2   Bathrooms                             2500 non-null   int64
3   Dist_to_School_km                     2500 non-null   float64
4   Dist_to_Hospital_km                   2500 non-null   float64
5   Dist_to_Railway_km                     2500 non-null   float64
6   Parking_Available                     2500 non-null   int64
7   Gated_Security                         2500 non-null   int64
8   Price_INR                             2500 non-null   float64
9   Total_Distance_Score                  2500 non-null   float64
10  Bath_per_BHK                           2500 non-null   float64
11  Amenity_Score                           2500 non-null   int64
12  Locality_Basavanagudi                  2500 non-null   int64
13  Locality_Bommanakatte                  2500 non-null   int64
14  Locality_Gadikoppa                     2500 non-null   int64
15  Locality_Gopala                         2500 non-null   int64
16  Locality_KHB Colony                    2500 non-null   int64
17  Locality_Sulebailu                     2500 non-null   int64
18  Locality_Vinoba Nagar                   2500 non-null   int64
dtypes: float64(7), int64(12)
memory usage: 371.2 KB
```

In [39]: `data.describe()` *#display the statistical info*

Out[39]:

	Total_SqFt	BHK	Bathrooms	Dist_to_School_km	Dist_to_Hospital_km	D
count	2.500000e+03	2500.000000	2500.000000	2.500000e+03	2.500000e+03	
mean	-1.243450e-16	3.108800	3.303600	-5.755396e-17	-2.025047e-17	
std	1.000200e+00	0.955682	1.045688	1.000200e+00	1.000200e+00	
min	-1.740655e+00	1.000000	1.000000	-1.444602e+00	-1.362739e+00	
25%	-8.678442e-01	2.000000	3.000000	-6.995763e-01	-7.509458e-01	
50%	-3.012504e-03	3.000000	4.000000	-3.042564e-01	-3.159989e-01	
75%	8.844263e-01	4.000000	4.000000	4.578747e-01	5.455304e-01	
max	1.714239e+00	4.000000	5.000000	2.957132e+00	2.843340e+00	

In [42]: `plt.hist(data['Price_INR'],bins=20 , color="#3d570e")`
`plt.xlabel("house price")`
`plt.ylabel("count")`
`plt.title("Distribution of house price")`
`plt.show()`



Step 3 : Split the Feature and Target

```
In [45]: X = data.drop("Price_INR",axis=1)
Y = data["Price_INR"]
```

Step 4 : Split the data into train and test

```
In [48]: X_train , X_test , Y_train , Y_test = train_test_split(X , Y , test_size = 0.2 , ra
```

Step 5 : Train the model

```
In [50]: model = RandomForestRegressor(n_estimators=100 , random_state=42)

# fit the model
model.fit(X_train , Y_train)
```

```
Out[50]: RandomForestRegressor ⓘ ?
  ▶ Parameters
```

Step 6 : predict on test data

```
In [51]: y_pred = model.predict(X_test)
```

Step 7 : Evaluate the model

```
In [53]: mae = mean_absolute_error(Y_test , y_pred)
rmse = np.sqrt(mean_squared_error(Y_test , y_pred))
r2 = r2_score(Y_test , y_pred)
print("mean absolute error :",mae)
print("mean squared error :",rmse)
print("r2 score :",r2)
```

```
mean absolute error : 270286.6
mean squared error : 388031.57508378103
r2 score : 0.9973779707757855
```

Step 8 : Visualize the Actual vs Predicted value

```
In [58]: plt.scatter(Y_test , y_pred,alpha=0.3 , color="#860f58")
plt.xlabel("Actual Value")
plt.ylabel("Predicted Value")
plt.title("Actual vs Predicted")
plt.show()
```

